From observation of a large number of cases of injury in the region of the brachial enlargement of the cord, he concludes that in all cases, however complex the symptoms may appear, we are able, by means of a careful consideration of the distribution of the paralysis and anæsthesia, to obtain a definite diagnosis. In this way many of the cases usually described as "concussion" of the cord may be much more accurately diagnosed. Of a total of about 350 railway accidents of all kinds, and 50 spinal injuries due to various causes, which have come under his observation, he has never yet seen an instance in which *spinal* symptoms were present where he could not definitely postulate some gross injury—fracture, hæmatomyelia, meningeal hemorrhage, myelitis, meningitis, or sprain, with pressure upon certain nerve roots, without requiring to fall back upon the unknown "molecular" changes supposed to constitute concussion; and, hence, he is strongly led to believe that such observation will enable us to detect many cases of imposture, in which symptoms are irreconcilable with any definitely localizable lesion.

OPHTHALMOLOGY.

UNDER THE CHARGE OF

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ON THE INJURIES TO THE EYES WHICH OCCURRED TO THE GERMAN ARMY IN THE WAR AGAINST FRANCE IN 1870–71.

A report, edited by the Medical Department of the Prussian War Office, with the assistance of the Medical Departments of the Bavarian, Saxon, and Wurtemburg Ministries, has just been issued. It is very complete and carefully compiled and deserves to occupy a place in the library of every ophthalmic student. In most respects it is a great improvement on similar reports in connection with other wars, and this greatly because of the more advanced state of ophthalmology at this time, and since the time of the Franco-German War.

Some points in the general statistics, which constitute the first section of the report, deserve attention. In all, 860 cases of injury to the eyes or to vision were recorded, a percentage of 0.86 of the whole number of wounded, and of 8.5 of the wounds of the head. Of these 860, 786 were cases of wounds of the eyes, and 64 such in which vision was in some way injured, or altogether destroyed, as the result of wounds to the brain and skull. This frequency of wounds to the eye is compared with that given in the statistics of other campaigns: thus in the French army, during the same war, the percentage was 0.81, and in the American war 1190 cases, or 0.5 of all the wounded, occurred. The left eye was more frequently wounded than the right in the proportion of 374 to 317, partly, it is supposed, owing to the position taken up by the infantry whilst firing, and partly to the protection which the gun affords to the right eye from individual bullet wounds. After deducting the cases of indirect injury, it was found that 96.2 per cent. of the wounds were caused by projectiles, and only 3.8 per cent. by bayonet or sword thrusts. Of the wounds from projectiles, again, 61.4 per cent. were bullet wounds, 38.6 per cent. wounds from portions of shells, etc. The percentage of the direct wounds—that is, such as were caused by projectiles striking the eye from the front, was found to be 0.28. Taking a radius of 12 mm. for each eye, we get a surface of 1808 sq. mm. for the extent over which direct wounds of either eye can take place; and taking the average surface of the whole body as equal to 1,185,000 sq. mm. the surface relation of the eyes to the whole body is as 0.15 : 100. But the eyes participate in the liability to injury of the whole head, which is twice as great as that of other parts of the body, so that the direct injuries were found to correspond closely in number to the calculated chances of injury. They formed also 2.6 per cent. of all the injuries of the head, a proportion which is the same as that of the exposed surface of the eyes to that of the head. The total number of cases of injury to the eyes was, however, so much greater that the compilers of the report have been led to assume that there must be a specific tendency to such wounds. This is explained partly on account of the small relative power of resistance possessed by the tissues of the eye, so that the blows, which in other parts of the body would do no particular harm, may produce serious damage to the eyes, partly on account of the great extent of the nervous connections of the eyes.

The second section of the report treats of the character of the wounds according to their cause. The different causes were: wounds with powder and from atmospheric compression, direct bullet and shell wounds, wounds produced indirectly by projectiles, bayonet and sword wounds, blows and other accidents.

Wounds from powder were mainly burns when the accident occurred, owing to an explosion near at hand, but there were also cases met with in which grains of coarse powder were found to have penetrated the eye. Injuries directly ascribable to mere atmospheric compression were very rare; one case is recorded in which, without any external wound, hemorrhage into the vitreous followed by detachment of the retina, resulted from the discharge of a musket close to the patient's temples by a man immediately behind. Similar cases have been recorded by MacCormack, Longmore, and others. Of the projectiles causing wounds of the eye, the immense majority were either conical lead bullets or portions of iron or lead shells. These, for the most part, produce complete destruction of the eye if they are received straight in the face, and either directly or by smashing the bone of the orbital wall.

Grazing shots only wounded the lids, and at the same time produced some slight denudation of the corneal epithelium. Some few cases were met with in which the bullet was lodged in the orbit without having injured the eye itself, and others, thirteen in all, where after complete destruction of the eye, the bullet was found to be lodged in the orbit.

Great variety was met with in the wounds to the eye caused by the bullet first striking the wall of the orbit. The eye was then mostly wounded indirectly, either by portions of broken bone, or as the result of hemorrhage or inflammation in its immediate vicinity. Of 72 cases of oblique hits, 34 broke through the temporal, 15 the nasal, 15 the upper, and 5 the lower wall of the orbit. In 2 others the bullet had entered at the neck, passed along under the base of the skull and entered the orbit from behind, causing destruction of the eye as it passed through it. In some cases the conformation of the bridge of the nose had evidently led to the bullets being deflected into the orbit.

Guthrie and Thomson both drew attention to the comparative frequency of the simultaneous wounding of both eyes by bullets. This was also observed in the Franco-German War. A bullet was found to have passed sometimes horizontally, sometimes obliquely through both orbits in 26 cases. Destruction of vision also took place in some cases from extension of the lines of fracture of the skull to the optic foramen, and from the wounding within the cranium of the nerve fibres and visual centres. The most noticeable feature connected with wounds from explosive shells was the frequency of such as resulted from small pieces of metal penetrating the eye. These accidents almost invariably occurred from explosions which took place very close to the individual wounded, consequently several pieces of metal as well as portions of earth, stone, powder, etc., were often found lodged in the eye or orbit. Indirect wounds from projectiles of all sorts were only met with in 19 cases—the most common were those in which a portion of the soldier's gun or helmet was splintered by being struck with the bullet and the eye injured by the splinters. Several cases were recorded of injury to the eye evidently through the smashing of spectacles, and in one the eye was wounded by a piece of horseflesh which had been carried off by a portion of burst bombshell. The comparatively few wounds of bayonet and sword thrusts, for the most part, only involved the lids.

The third section of the report contains a very complete discussion of the types of accidents met with. These are treated under three headings:

1. Contusions and concussions of the eye;
2. Wounds in a stricter sense; and
3. Affections of the eye not immediately the result of the particular accident, but due to subsequent changes in the immediate neighborhood or in other parts of the body.

This section, while it contains nothing perhaps absolutely new, has been compiled in the most thoroughly critical manner, and the different injuries are discussed with very full reference to the literature of the subject. It will certainly well repay a careful study, and is distinctly the best part of the report, but contains too much to condense into an abstract.

The next section has reference to the cases in which sympathetic changes occurred in the other eye. This important chapter seems only to have been included in one other similar report, viz., that on the American war. Though carefully compiled, it is far from being as satisfactory as the other sections, and that because there is no discrimination made between the serious, and more or less malignant form of undoubted sympathetic inflammation, what is now with good reason considered to be an inoculation of the second eye with microörganisms, and the doubtful, and at all events comparatively trivial other forms of sympathy. The number of the cases is swelled, too, by including all in which there was merely sympathetic irritation. In ninety-seven cases in all, it is considered that a sympathetic origin existed for the subsequent conditions met with in the other eye. It was remarked, too, that all the affections of the second eye were met with in cases similar to such as have been found by experience to predispose to sympathy. Only at most seventeen per cent. of the cases were actual inflammations of the second eye. Sympathetic changes most frequently made their appearance between six months and a year after a wound in the first eye had been received.

THE PATHOGENESIS OF SYMPATHETIC OPHTHALMIA.

DR. RANDOLPH, of Baltimore (*Archives of Ophthalmology*, vol. xvii. 2), has made a number of careful experiments on the same lines as those which led Deutschmann some time ago to pronounce so strongly in favor of the view, entertained by Shellen and others, that sympathetic inflammation as it is met with clinically is the result of inoculation of the second eye with micro-organisms which find their way directly from one eye to the other along the optic nerves. Dr. Randolph, although his experiments seem to have been conducted with great care, and have been sufficiently numerous to enable him to form a trustworthy opinion, has been unable to confirm any of Deutschmann's assertions. Both in dogs and in rabbits, the latter alone having been made use of by Deutschmann, nothing which could in any way be looked upon as of the nature of sympathetic inflammation followed the inoculation of the first eye with some drops of a suspension of the staphylococcus aureus in sterilized water. Dr. Randolph also failed to find micrococci in human eyes enucleated after perforating injuries.

These results, therefore, reopen the question as to whether or not it is possible to produce anything experimentally, which corresponds to sympathetic ophthalmitis in man. The experimental evidence then of the microbiotic origin of sympathetic ophthalmitis has still to be confirmed. All the clinical facts connected with that curious affection are, however, very much in favor of the migration hypothesis, which may, indeed, be said to afford a very excellent and welcome guide so far, with respect to treatment. Dr. Randolph seems to be fully alive to this, and deserves credit for not having lost sight of the clinical indications, notwithstanding the entirely negative result arrived at from his careful and interesting experimental researches.

SNOW-BLINDNESS.

DR. BERLIN, of Stockholm, a member of Nordenskiöld's expedition to Greenland in 1883, gives (*Nordiskt Medicinskt Arkiv.*, vol. xx. No. 3) a very complete account of snow-blindness. The symptoms, geographical distribution, and cause of that affliction, have engaged his attention. He begins with a very complete *résumé* of the references to snow-blindness in literature, and finds the first mention of it in Xenophon's *Anabasis* (book iv. chap. v.).

Snow-blindness occurs principally in Arctic regions, as in Greenland, Canada, the Siberian coast, Spitzbergen, and the surrounding ocean. It has been met with, too, as far north as man has reached. On the American continent it extends further south than elsewhere, except in high mountainous regions. It does not occur in Iceland, or in Norway and Sweden, with the exception, again, of isolated cases met with in the mountains. To judge from the protective measures taken by natives in Arctic regions, Esquimaux, and Siberians, it must be a common enough occurrence there. Whenever it occurs in Arctic or Alpine regions it only attacks those who are out in the open air. It begins to show itself soon after the sun first makes its appearance at the conclusion of the Arctic night. By far the greatest number of cases within the Arctic circle take place in the months of April and May. Berlin believes that in Alpine districts again it might occur at any time, while its greater frequency in spring and summer is to be ascribed to the fact that most Alpine climbing is done at those times. A great many Arctic travellers have noticed that the weather which seems most to favor the occurrence of snow-blindness is what is differently described by them as a peculiar kind of "thick," "heavy," "misty," "foggy," or "hazy" weather. Nothing seems, however, to be known as to the real nature of this weather. The temperature has generally been found to be below the freezing-point.

The affection begins very much like cases of catarrhal conjunctivitis with a feeling as if sand or some foreign body were in the eye, and a desire to blink and shade the eyes. An examination at this period reveals nothing further than a slight hyperæmia of the conjunctiva, increased lachrymation, and slight contraction of the pupils. This is succeeded by an aggravation of the symptoms leading to constant burning pain which radiates over the temples, etc. This gradually leads, too, to blepharospasms, and the patient has then to be led about. The objective appearance at this time are: increased hyperæmia and chemosis of the conjunctiva, the chemosis being limited, however, to a narrow band surrounding the cornea and corresponding to the portion exposed when the eyes are open. Berlin has always found the cornea intact, but others (Envall and Gardner) have described cloudiness and even ulceration of the cornea. The ophthalmoscopic examination reveals nothing distinctly abnormal, and there is no real night or day blindness. Snow-blindness may come on very quickly, in a quarter of an hour even, as observed by Coppinger; the rapidity of onset depends on the degree of completeness of the precautions taken against it. In cases in which the eye has been properly shaded, the affection is longer in developing, and is less likely to be so severe. It lasts two or three days only, if the patient be treated indoors, but removal to the dark does not of itself in any way appear to soothe the suffering. All, even natives, are equally subject to it when the condition are favorable to it. In a few cases only one eye has been affected. An interesting example of this is given: the case of a sergeant who was attacked in the right eye during an expedition from West to East, and some time afterward, and after complete recovery, was again attacked in the left eye whilst the expedition was moving from East to West. Eight other cases met with by the explorers are referred to which show that it is always the eye to the side of the sun which is affected when one alone suffers.

As to the nature of snow-blindness it has usually been supposed that it is a retinal affection caused by irritation from the excessive flare of the light reflected from the snow. This irritation is supposed to give rise to pain and photophobia, and to lead reflexly to irritation of the conjunctiva. Berlin observes, however, that there is absolutely no similarity between the conditions known to be produced by strong light and snow-blindness; there is no pain or photophobia, and no change in the anterior part of the eye, but diminished visual acuity and scotomata. He further points out that the freer the atmosphere is from water vapor the more powerfully is the solar radiation felt. This fact, first discussed by Saussere on ascending Mont

Blanc in 1774, has been abundantly confirmed since by physicists. When in very cold regions, then the sun's rays are felt most burning. The members of Nordenskiöld's Greenland expedition suffered considerably from sunburning. The exposed skin was frequently the seat of an exudative dermatitis. A similar condition is well known amongst Alpine climbers as "Schneerose." Why should the eyes escape, then, an irritation which is so active in other exposed parts? is the reasoning to which Berlin leads up. He considers snow-blindness to be simply, as in his experience it has all the appearance of being, an erythematous conjunctivitis. Tables are given which show that it is most frequent at those times of the year when the solar radiation penetrates most strongly to the surface of the earth. It is mostly met with, too, in very dry regions, and is absent in Norway and Iceland, as he believes, on account of the influence of the Gulf Stream on the moisture of the atmosphere. It was shown by Jensen, in experiments on different animals, that less than 10 per cent. of the heat rays impinging on the eye penetrate to the retina, while 50 per cent., at least, are absorbed by the cornea. The cornea, therefore, receives the greatest burning, and this may well account for the photophobia, as well as for the occasional ulceration referred to. The snow and ice hazes, which have also been found to cause snow-blindness, and the nature of which has never properly been explained, he considers to be cirri which have descended to the ground, and which produce their effect on the eye by simple mechanical irritation.

OTOLOGY.

UNDER THE CHARGE OF

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FOREIGN BODIES IN THE EAR.

DR. A. MARIAN, of Aussig, Bohemia, adds one more timely warning on this important subject (*Prager med. Wochenschrift*, Oct. 17, 1888). In answer to the question "What shall the general practitioner do when confronted with a foreign body in the ear?" he says: The first thing to be done is to convince himself that a foreign body is really in the ear; also whether it is really in the ear the patient says contains it. It has happened that the patient, in his excitement, has presented the wrong ear for treatment. If, now, the foreign body being present in the ear, any instrument is inserted, without the proper illumination of the ear, not only will the patient suffer pain, but he runs a great risk of receiving an injury to his membrana tympani. After having diagnosticated the presence of a foreign body with the aid of a mirror, the next step is to determine its position, whether it lies in the meatus, the isthmus, or against the membrana in the fundus of the auditory canal. Then the employment of a moderately strong syringing with warm water will usually dislodge and bring out the foreign substance, if it is not wedged tight.